

App. No. 09/746,949
Amendment dated July 6, 2004
Reply to final Office action of April 21, 2004

Listing of claims:

1. (Currently amended) A computer-implemented method for obtaining scratch registers for use by a procedure in a computer-executable binary, comprising:

(a) identifying ~~determining~~ a maximum number of registers requested by the procedure ~~requested from a plurality of register requests after the computer-executable binary is compiled~~; and

identifying an additional number of scratch registers for use by the procedure;

generating a number of registers by adding the maximum number of registers and the additional number of scratch registers;

(b) modifying the computer-executable binary ~~each register request in the plurality of register requests~~ to request the ~~maximum~~ number of registers ~~plus an additional number of registers~~; and

requesting the number of registers.

2. (Cancelled)

3. (Cancelled)

4. (Currently amended) The method of claim 1 ~~3~~, ~~wherein the additional number of registers corresponds to a selected number of scratch registers and wherein each of the scratch registers is indexed by an index that remains constant throughout the procedure.~~

5. (Currently amended) The method of claim 1, ~~further comprising~~

(c) ~~using at least one of the plurality of modified register requests to support~~ wherein the number of requested registers is used for supporting instrumentation code in the computer-executable binary.

6. (Original) The method of claim 1, wherein the computer-executable binary is constructed for execution on a processor configured to execute a speculative instruction.

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7. (Original) The method of claim 6, wherein data is stored in a register in association with the speculative instruction, and wherein moving the data to a main memory results in a hardware fault.

8. (Currently amended) A computer system, comprising:
(a) a computer-executable binary;
(b) a procedure boundary detector configured to identify a procedure of the computer-executable binary ~~after the computer-executable binary is compiled~~; and
(c) a scratch register allocator that is configured to:
receive the identified procedure from the procedure boundary detector; and to
modify the computer-executable binary to request a maximum number of registers associated with the procedure and a number of scratch registers used by the procedure.

9. (Original) The system of claim 8, wherein the computer-executable binary comprises at least one register allocation request.

10. (Original) The system of claim 9, wherein the scratch register allocator provides at least one scratch register by modifying the at least one register allocation request.

11. (Currently amended) The system of claim 8, further comprising:
(d) a basic block detector configured to receive the identified procedure from the procedure boundary detector and to identify at least one basic block in the identified procedure; and
(e) a dominating register allocation detector configured to receive the at least one basic block and to detect at least one dominating allocation for the at least one basic block.

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wherein the scratch register allocator is further configured to receive the at least one basic block identified and the at least one dominating allocation detected.

12. (Original) The system of claim 11, wherein the basic block detector is further configured to construct a control flow graph using the at least one basic block identified.

13. (Original) The system of claim 12, wherein the scratch register allocator is further configured to receive the control flow graph.

14. (Currently amended) A computer-readable medium having computer-executable instructions, comprising:

(a) ~~identifying~~ discovering a procedure in the computer-executable instructions, wherein the procedure includes at least one register request, and wherein the procedure uses a number of scratch registers after the computer-executable instructions are compiled; and

(b) ~~if a register allocation does not exist at the beginning of the procedure, inserting a register allocation~~

determining a maximum number of requested registers in the procedure; and
requesting the maximum number of requested registers plus the number of scratch registers used by the procedure.

15. (Cancelled)

16. (Currently amended) The method of claim 14, further comprising:

(c) for a basic block in the procedure:

(i) finding at least one dominating allocation; and

(ii) modifying the at least one dominating allocation to request the a
number of scratch registers.

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17. (Currently amended) The method of claim 14, further comprising:
- (c) finding at least one basic block in the procedure;
 - (d) constructing a control flow graph from the at least one basic block;
 - (e) using the control flow graph to discover at least one dominating allocation; and
 - (f) modifying the at least one dominating allocation to request the a number of scratch registers.